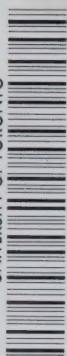


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MICROSCOPIC STUDIES OF THE
PERIODONTAL POCKET.

HAROLD K. BOX, D.D.S. PH.D.

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Microscopic studies of the
periodontal pocket.

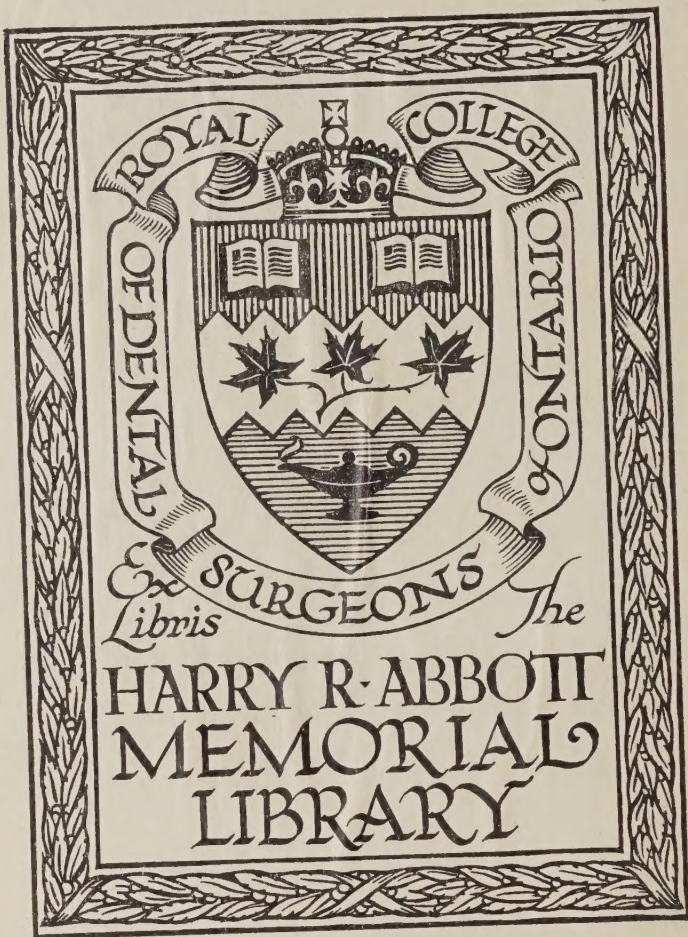
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Microscopic Studies of the Periodontal Pocket

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Microscopic Studies of the Periodontal Pocket

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The photomicrographs with legends shown in these pages have been selected from a series of one hundred and twenty-five illustrations to be used in a Bulletin by Doctor Box,—“Treatment of the Periodontal Pocket”,—now nearing completion and to be published by the University of Toronto at an early date.

The photomicrographs were made by G. R. Anderson, B.A.Sc., M.A., Professor of Engineering Physics and Photography, University of Toronto.

There has been no attempt to arrange these photographic studies in any particular sequence. They have been informally assembled for presentation at the meeting of the American Association of Dental Schools to be held in Washington, March, 1928.



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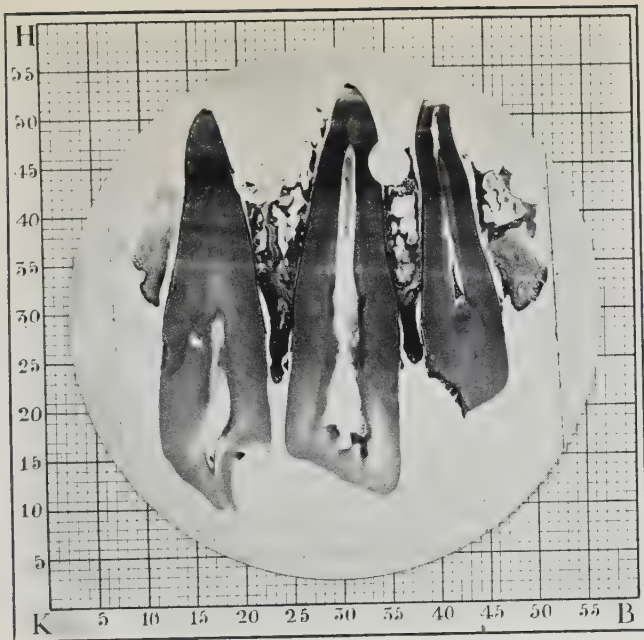


FIG. 1—X3. PERIODONTAL POCKETS (HUMAN).

This low magnification of upper centrals and lateral, shows six proximal pockets of varying depths.

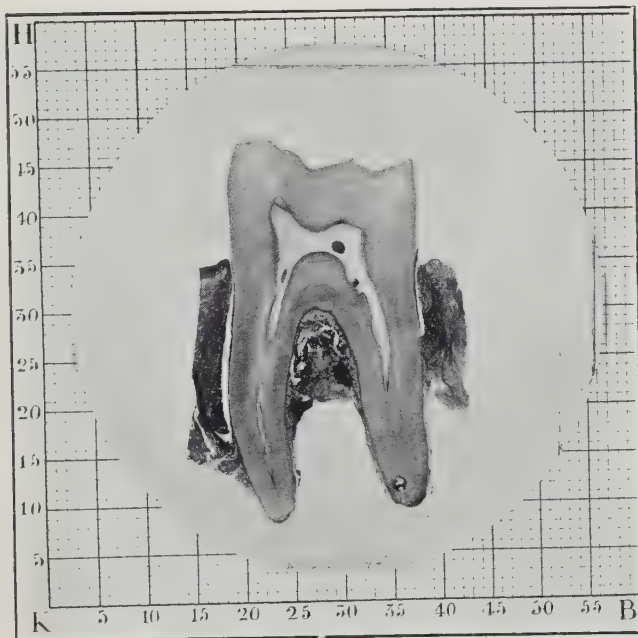


FIG. 2—X3. PERIODONTAL POCKETS (HUMAN).

This extremely low magnification of the Lower Right First Molar shows mesially and distally very deep pockets. The mesio-proximal pocket is seven millimeters deep.

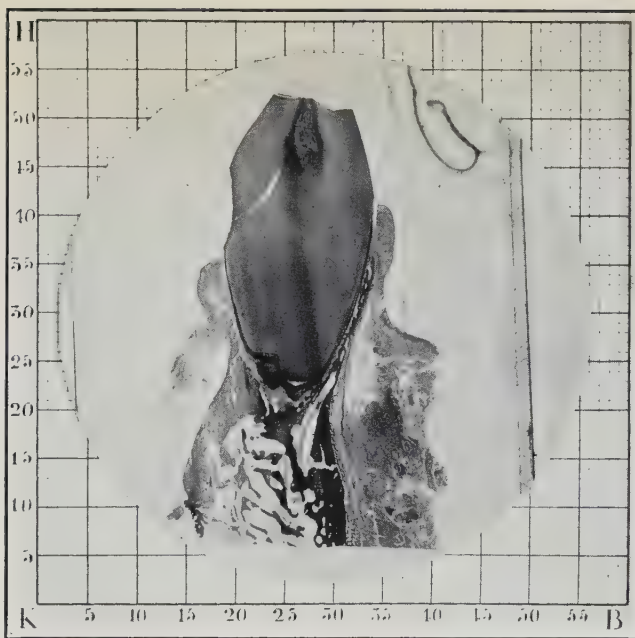


FIG. 3—X2½. PERIODONTAL POCKETS (HUMAN).

Extremely low magnification of longitudinal section of Lower Right Molar showing buccal and lingual pockets. These pockets are relatively shallow due to gingival atrophy.

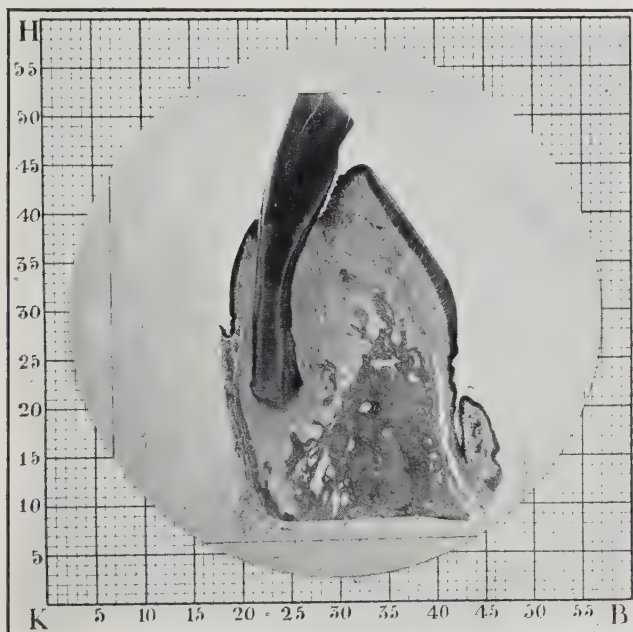


FIG. 4—X3. PERIODONTAL POCKET (SHEEP).

This illustration shows a fairly deep pocket on the lingual of a lower incisor, which in the sheep is on the side of tension or pull. On the side of compression or push, the pocket is shallow, due to the atrophy of the gingival tissues.

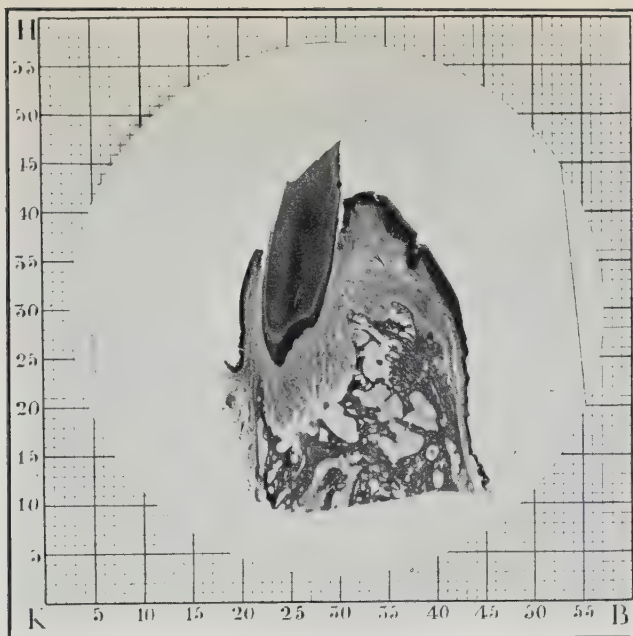


FIG. 5—X3. PERIODONTAL POCKET (SHEEP).

Here again is shown a deep pocket on the side of tension, while the compression-side presents a pocket of fairly shallow depth.

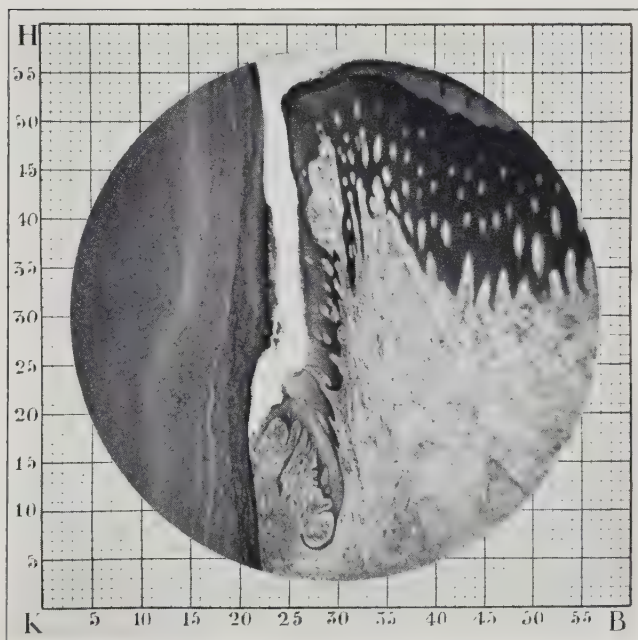


FIG. 6—X40. PERIODONTAL POCKET (SHEEP).

Showing the epithelium covering the soft tissues to its base. The epithelial lining is much thinner than that of the gingival mucosa, comparable to the differences seen in tonsillar crypts.

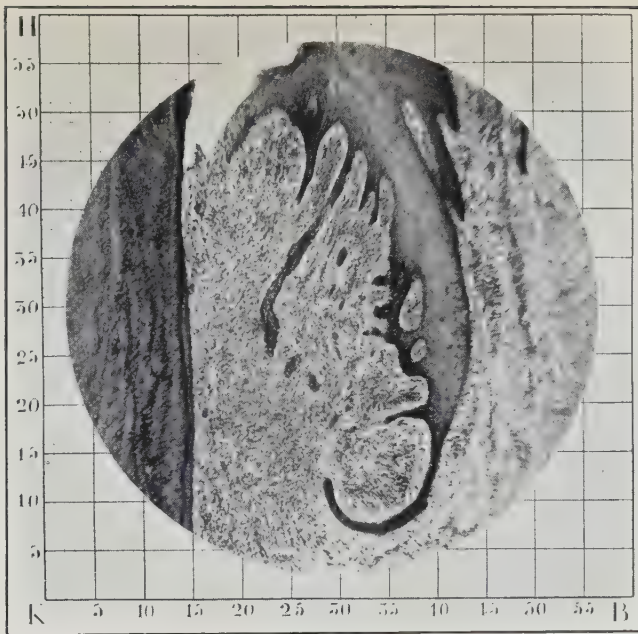


FIG. 7--X80. PERIODONTAL POCKET.

This higher magnification of the base of the pocket seen in Fig. 6, shows the finger-like extensions of epithelium penetrating in various directions, the sub-epithelial granulation tissue.

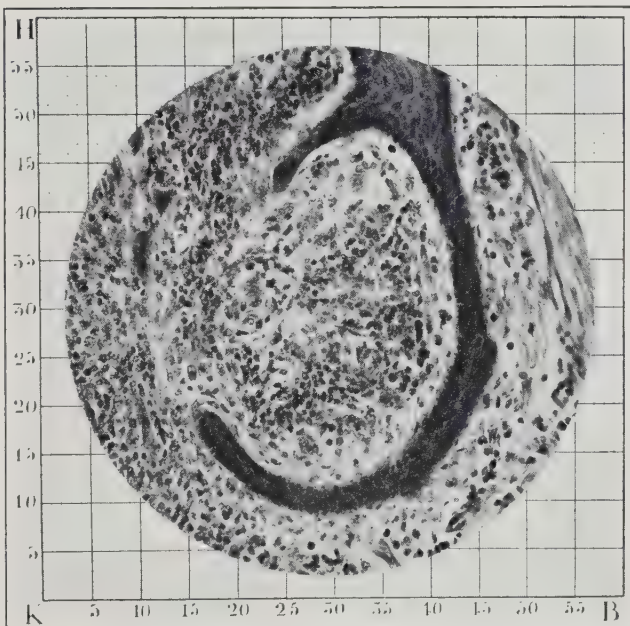


FIG. 8 X200. PERIODONTAL POCKET.

This is a still higher magnification of the deepest epithelial strand shown in Fig. 7. Note the granulation tissue into which it is extending.

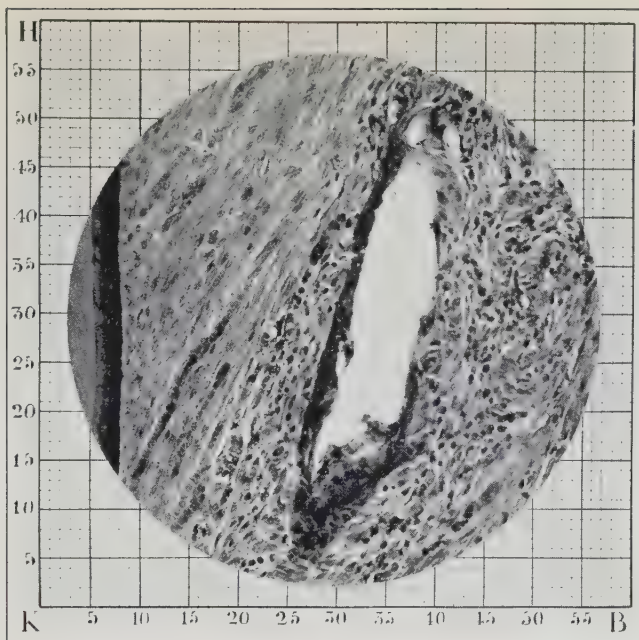


FIG. 9—X200. GINGIVAL CYST (SHEEP).

Here is shown in the connective tissue of the gingiva, a small cavity lined with epithelium.

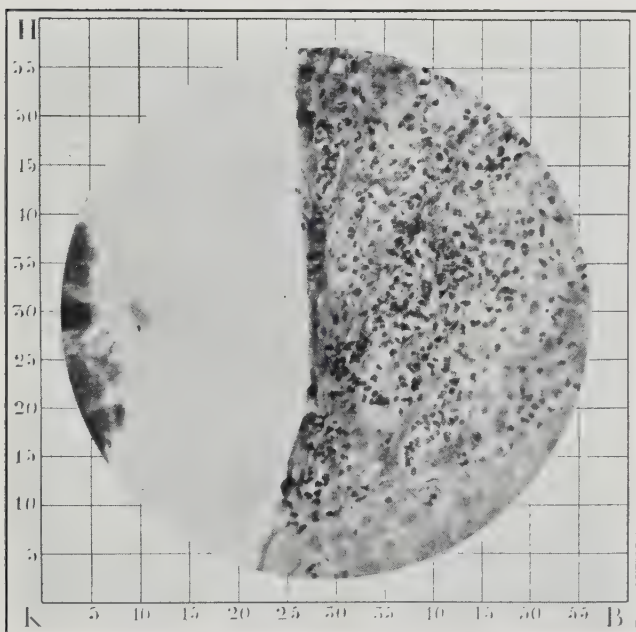


FIG. 10—X265. PERIODONTAL POCKET (HUMAN).

This photomicrograph presents a small part of the soft tissue wall of the pocket showing capillary reaction and hemorrhage in the tissues opposite a nodule of calculus. Note also the extremely thin covering of epithelium.

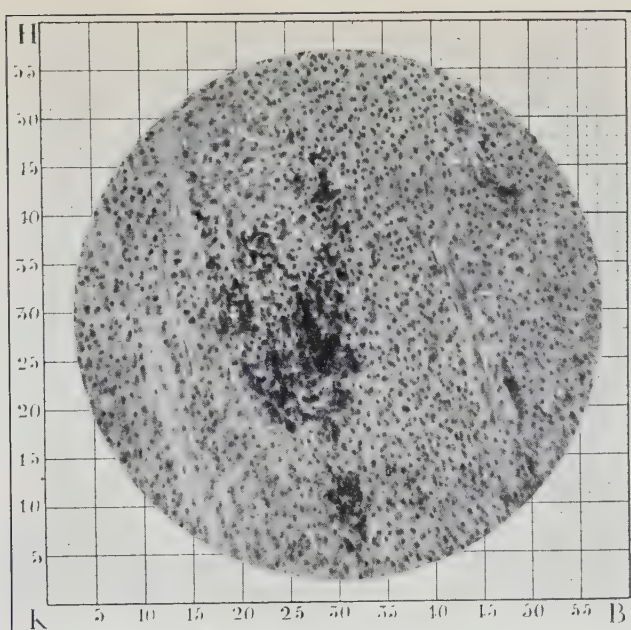


FIG. 11—X265. PERIODONTAL POCKET (HUMAN).

This illustration shows in the granulation tissue of the pocket wall zones of hemorrhage. By diapedesis, the red blood-cells have become extravasated, passing through the vessel-walls without rupture.

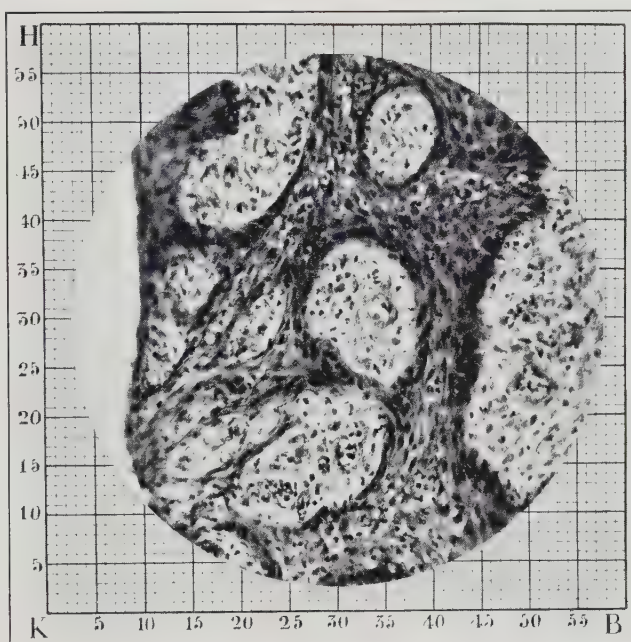


FIG. 12—X200. PERIODONTAL POCKET (HUMAN).

Small zone of soft tissue wall of pocket showing thin layer of epithelium covering the connective tissues, and extending from it, various penetrating epithelial strands.

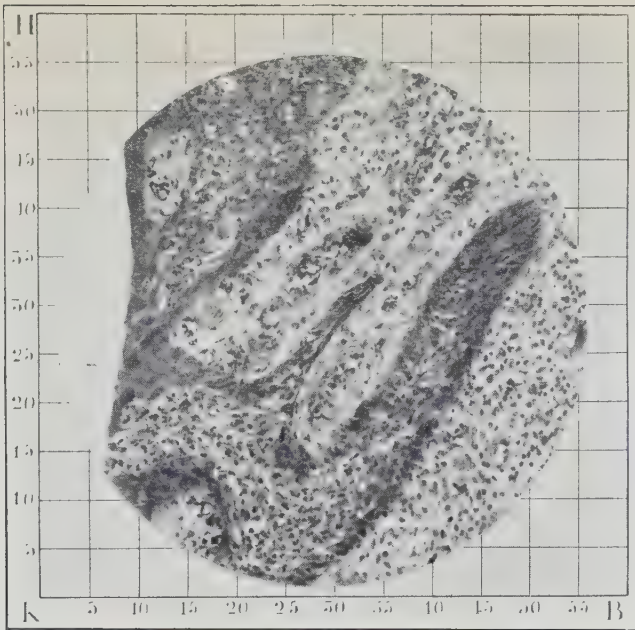


FIG. 13—X200. PERIODONTAL POCKET (HUMAN).

Small zone of soft tissue wall showing finger-like extensions of epithelium, growing from the surface into the underlying tissues.

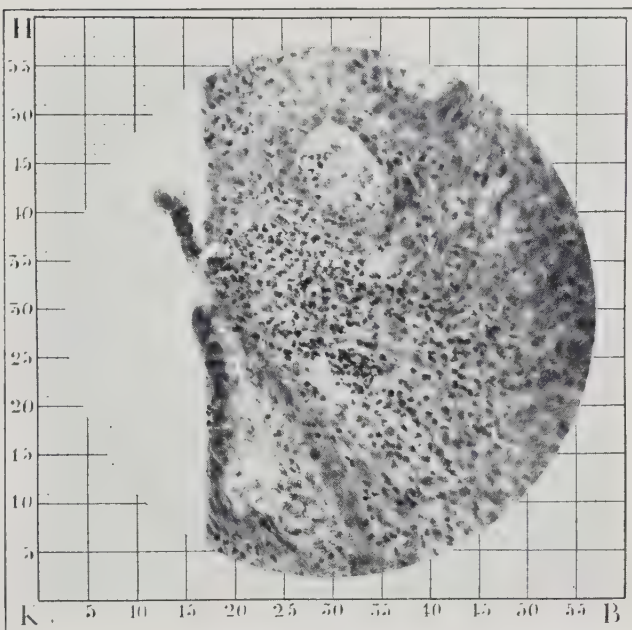


FIG. 14 —X200. PERIODONTAL POCKET (HUMAN).

Small portion of soft tissue wall of pocket showing minute break in the epithelial lining with zone of acute inflammatory reaction in the adjacent underlying connective tissue.

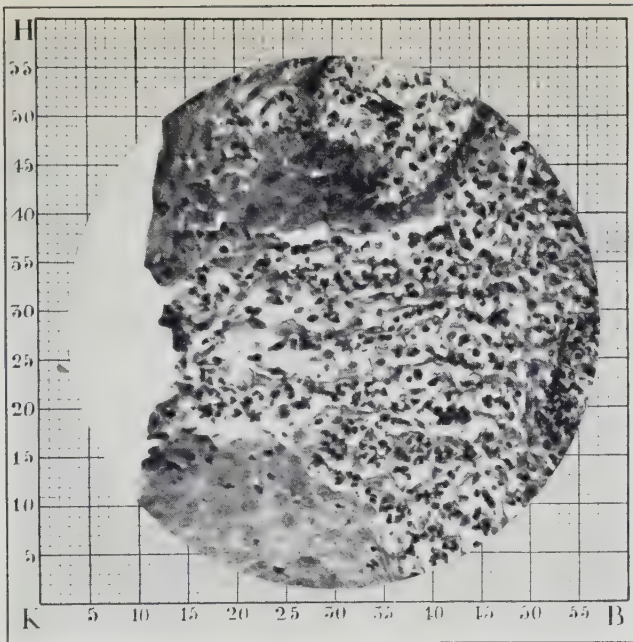


FIG. 15—X265. PERIODONTAL POCKET (HUMAN).

Small zone of soft tissue wall of pocket showing a break in the epithelial lining, and cellular infiltration in the exposed connective tissue.

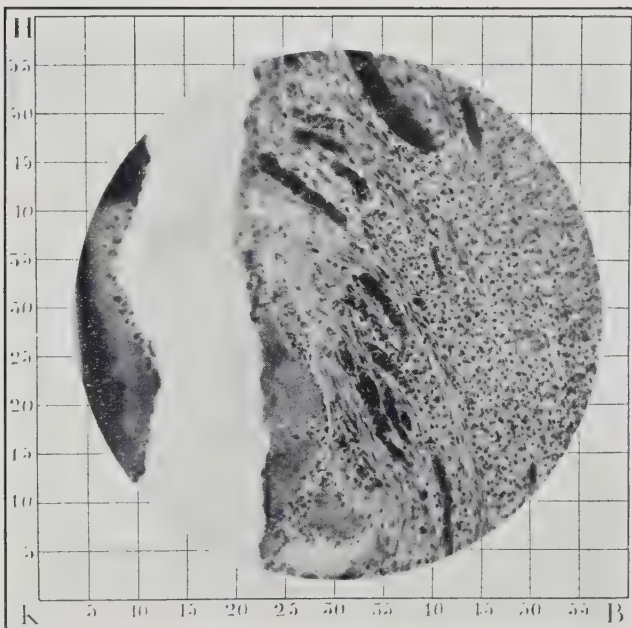


FIG. 16—X200. PERIODONTAL POCKET (HUMAN).

In this photomicrograph is shown the rich capillary bed which has developed opposite the irritant,—a nodule of calculus.

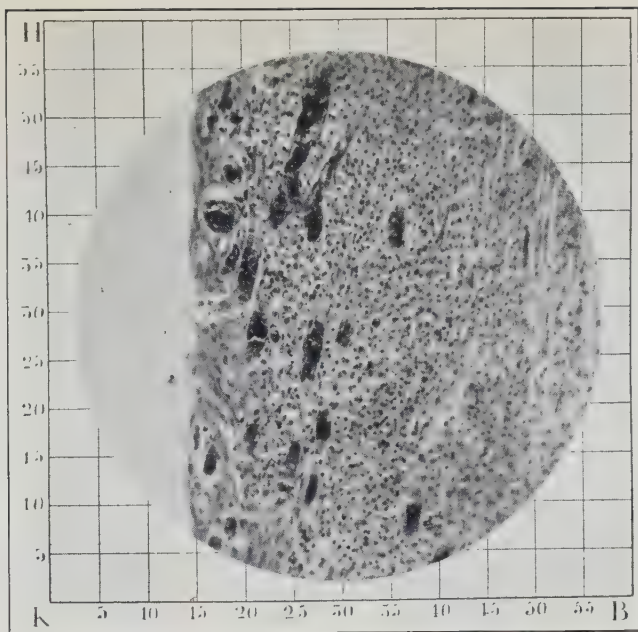


FIG. 17—X200. PERIODONTAL POCKET (HUMAN).

Another demonstration of the capillary bed of the granulation tissue in the soft tissue wall of the pocket. Note also the thinness of the epithelial layer.

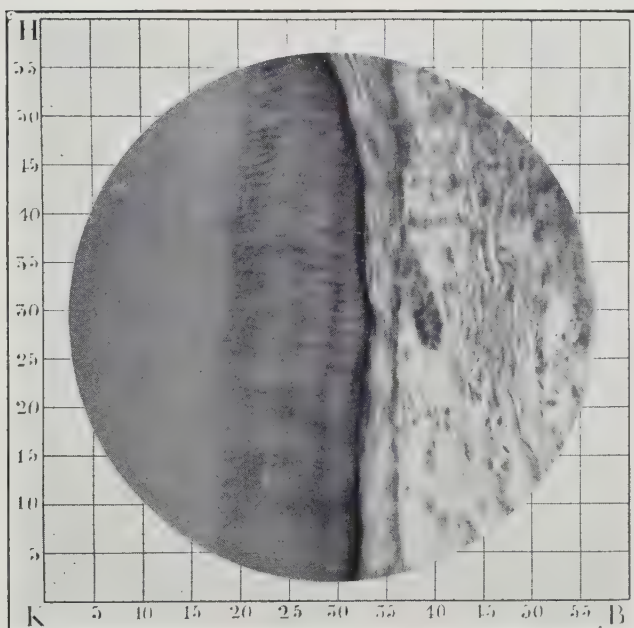


FIG. 18—X400.

This photomicrograph shows an epithelial cord or rest in the gingival tissues near the base of the crevice, the cells of which are proliferating and fusing with the epithelial attachment. (Human.)

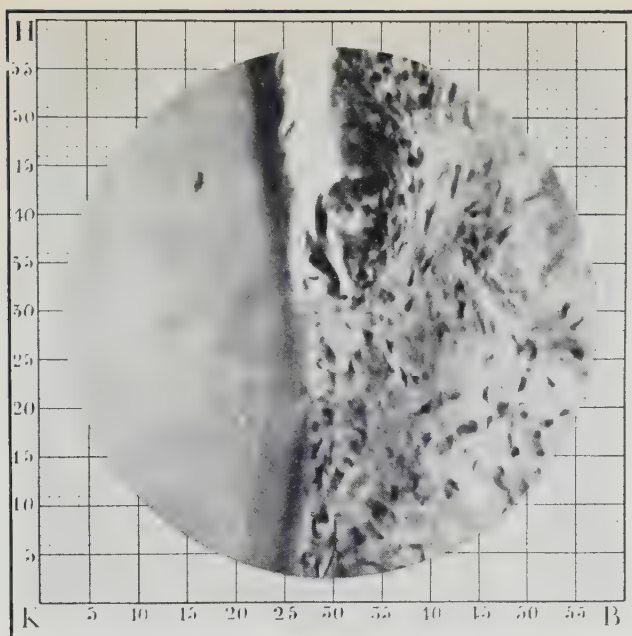


FIG. 19—X400. POCKET FORMATION (HUMAN).

This photomicrograph shows the base of a deep periodontal pocket. Epithelium covers the soft tissue wall. Immediately beneath the pocket-base there is to be noted in the connective tissue, a small wedge-shaped zone in which the fibers and cells have lost their staining capacity and have become somewhat indistinct. It is evident that here the tissues have undergone a definite chemical change. This condition in many instances precedes detachment of the fibers from the cementum.

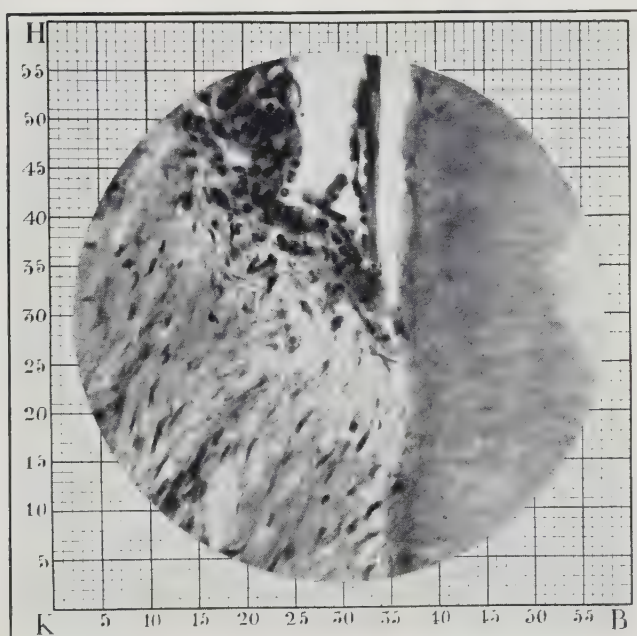


FIG. 20—X400. POCKET FORMATION (HUMAN).

This photomicrograph shows the base of another periodontal pocket. Note the epithelium covering the soft tissues to the pocket-base, also the cementum cuticle which has been separated from the tooth in the preparation of the section. Here again is presented a fairly large wedge-shaped zone in the connective tissue beneath the pocket-base, in which the cells and fibers are poorly defined. This change evidently precedes actual stripping of the principal fibers from the tooth.

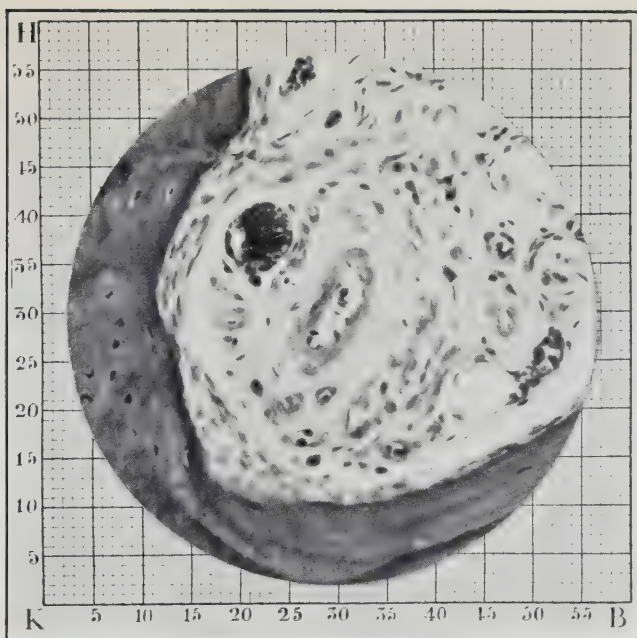


FIG. 21—X265. RAREFYING PERICEMENTITIS FIBROSA (HUMAN).

In this photomicrograph the blood-vessel in the centre of the field presents a marked concentric perivascular fibrosis.

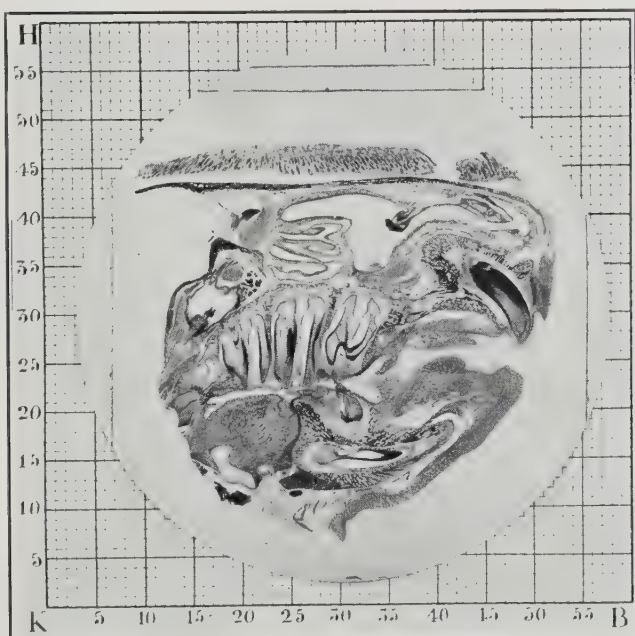


FIG. 22—X3. RABBIT'S HEAD.

This section of the head of a young rabbit shows teeth in various stages of eruption. The large chisel-like incisor, in the upper denture, has not yet penetrated the oral epithelium. Behind the diastema in the upper denture a molar crown has just broken through into the oral cavity. Distal to this tooth, another molar is to be seen, the cusps of which are some little distance from the oral epithelium.

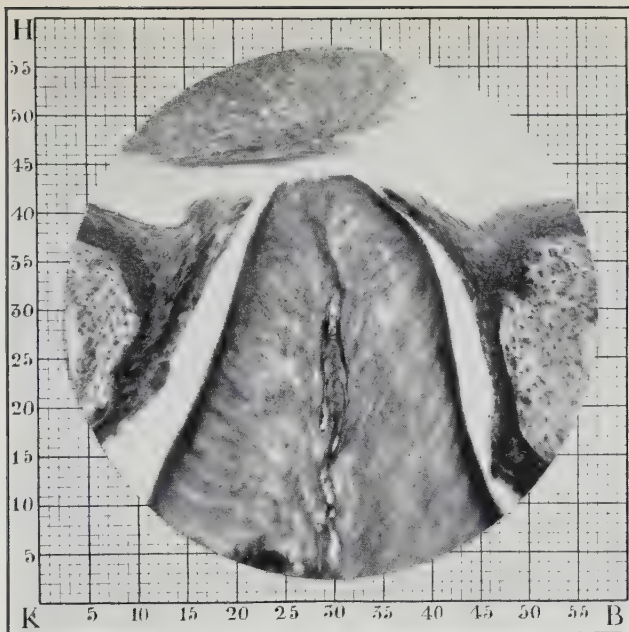


FIG. 23—X100. ERUPTING TOOTH OF RABBIT

This illustration shows the tooth projecting into the oral cavity, with the outer enamel epithelium uniting with the oral epithelium to form the gingival margin.



FIG. 24—X100. EARLY GINGIVAL CREVICE (HUMAN).

Upon eruption the stratified outer enamel epithelium unites as a rule with the oral epithelium. In this illustration of the gingival tissues of an erupting tooth, is to be noted the base of the gingival crevice formed by the amelo-gingival angle. In this instance, it is situated on the enamel midway between the enamel-line and the incisal edge. A small break separates the oral epithelium from the outer enamel epithelium, and beneath it is to be seen a zone of small cell infiltration.

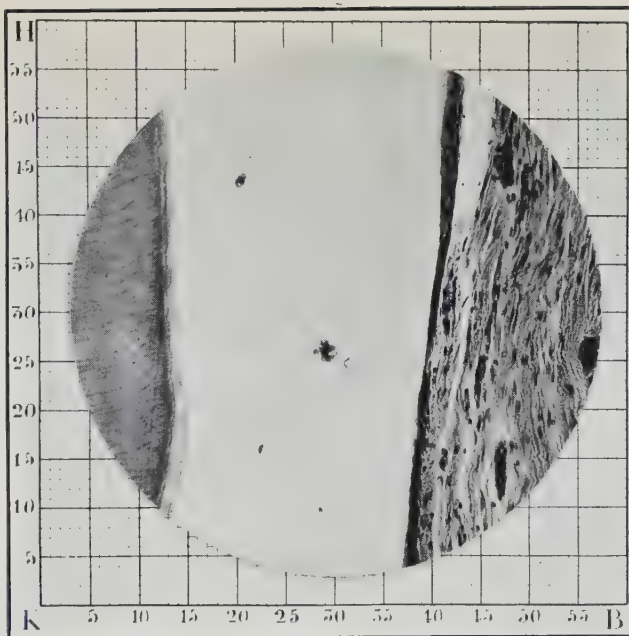


FIG. 25—X200. OUTER ENAMEL EPITHELIUM (HUMAN).

The band across the enamel formed by the epithelial attachment, first extends to the amelo-cemental junction, in other words to the full extent of the outer enamel epithelium. In this photomicrograph of the same erupting tooth as described in Fig. 24, the tissue-relations between the gingival crevice and the enamel-line are shown. Note the space left by the enamel after decalcification, and the outer enamel epithelium which prior to decalcification was united to both the enamel and the gingival connective tissue.

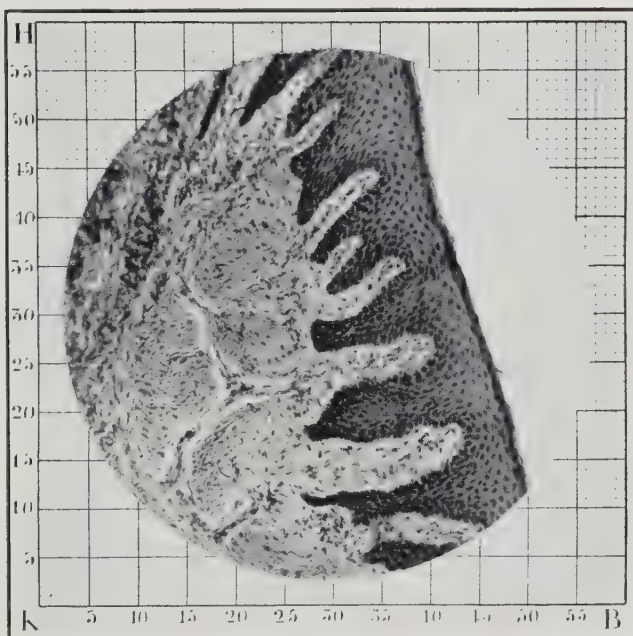


FIG. 26—X132. GINGIVAL MUCOSA (HUMAN).

This illustration shows the oral epithelium,—stratified squamous, which covers the marginal and cemental gingivae. Note the connective-tissue papillae which extend into the epithelium.

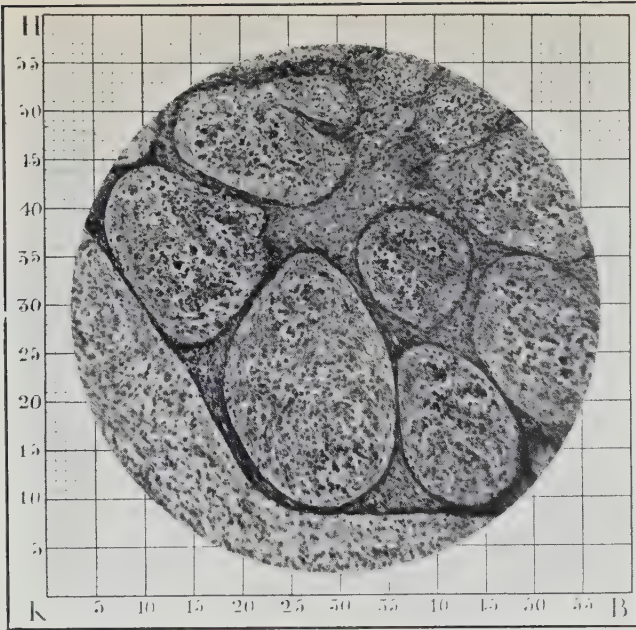


FIG. 27—X100. EPITHELIATED GRANULOMA (HUMAN).

In this illustration, there is presented a striking example of the extension of epithelial strands throughout the granuloma.

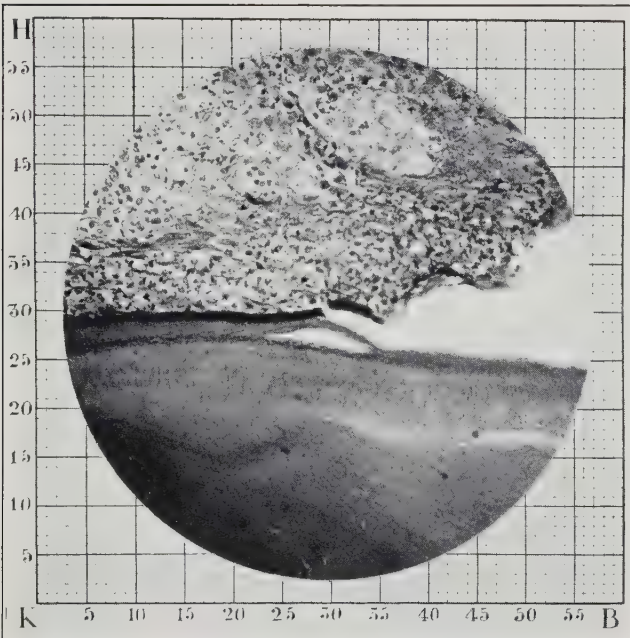


FIG. 28—X200. CEMENTUM CUTICLE (HUMAN).

In this photomicrograph of a bifurcation-granuloma, the epithelium proliferating along the cementum has produced a well formed horn-layer or cuticle.

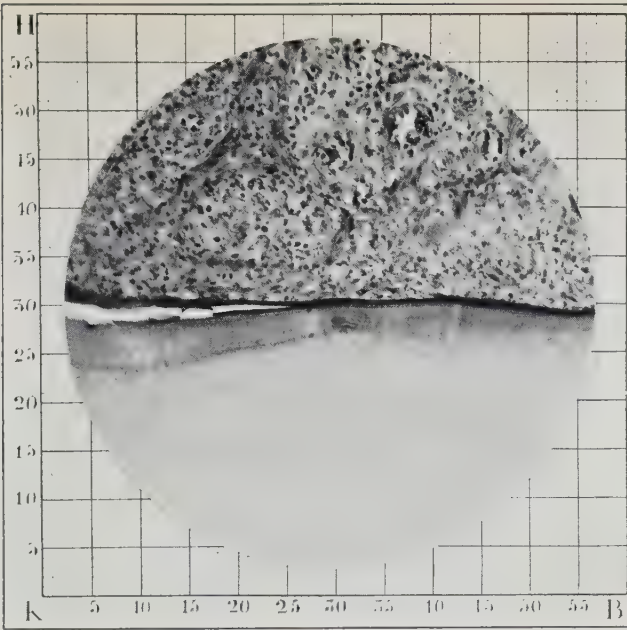


FIG. 29—X200. CEMENTUM CUTICLE (HUMAN).

Here is shown, as in Fig. 28, a splendid example of cementum cuticle formed by the epithelium in a granuloma in a molar-bifurcation.

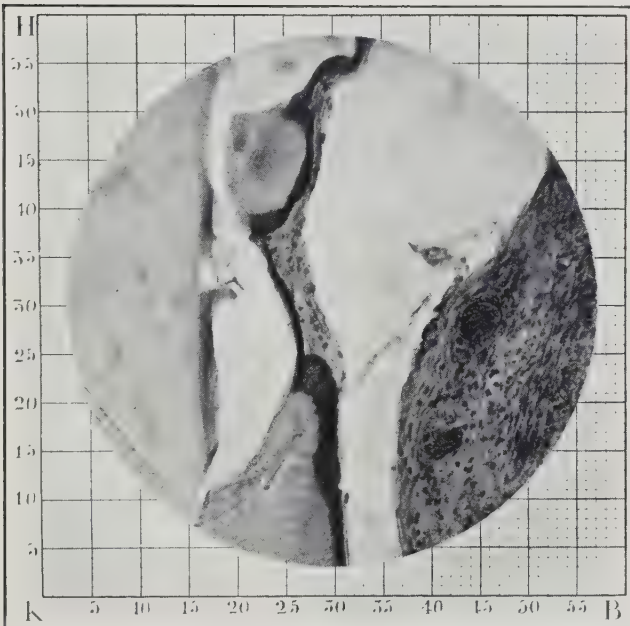


FIG. 30—X265. THE AMELO-CEMENTAL JUNCTION (HUMAN).

Showing the cementum cuticle continuous with the outer component of Nasmyth's membrane, the secondary enamel cuticle of Gottlieb.

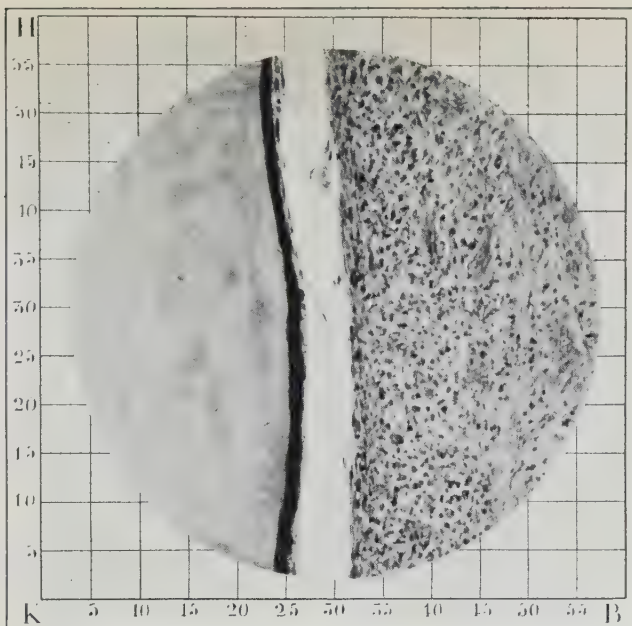


FIG. 31—X265. CEMENTUM CUTICLE (HUMAN).

In this illustration there is presented a striking example of pocket formation in which, after separation of the epithelium from the tooth, a homogeneous keratinised layer,—the cementum cuticle, has remained adherent to the cemental surface.

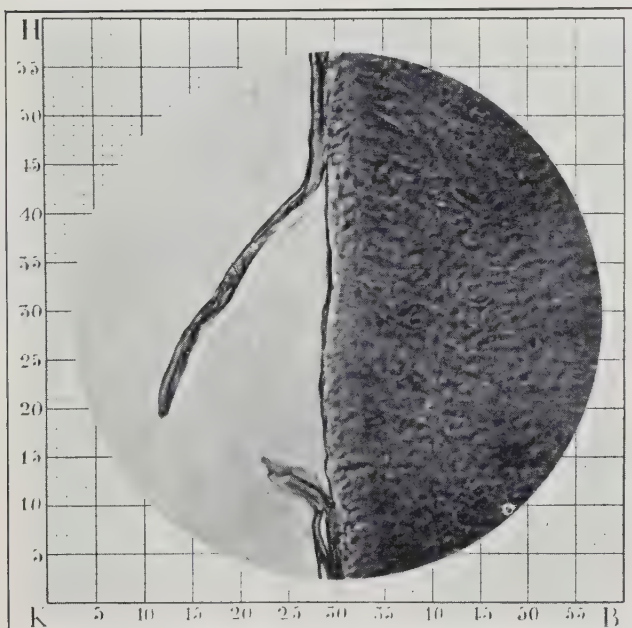


FIG. 32—X600. CEMENTUM CUTICLE (HUMAN).

This high magnification shows the keratinised layer, the cementum cuticle, broken and lifted from the cemental surface.

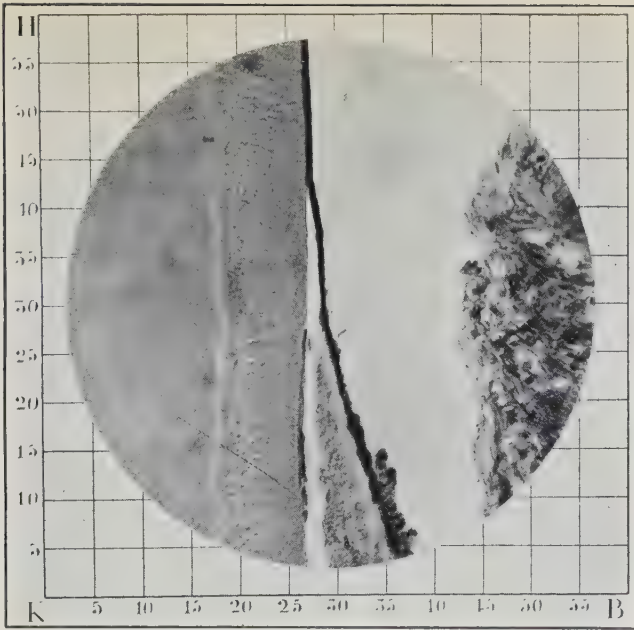


FIG. 33—X265. CEMENTUM CUTICLE (HUMAN).

In this illustration, the keratinised or horn-layer is demonstrated passing from the cemental surface, to which it is firmly adherent, over a nodule of calculus. It is obvious that in this case, tissue separation and calculus deposition have preceded cuticle formation.

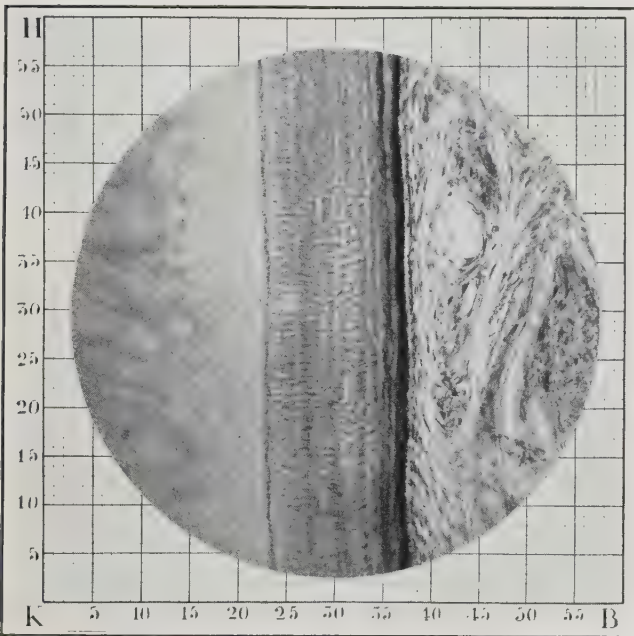


FIG. 34—X200. NON-CELLULAR CEMENTUM (HUMAN).

In this photomicrograph, the lamellae or layers of this tissue are to be noted; also the Sharpey's fibres which appear as minute rods running through it at right angles to the lamellae. Note the absence of lacunae.

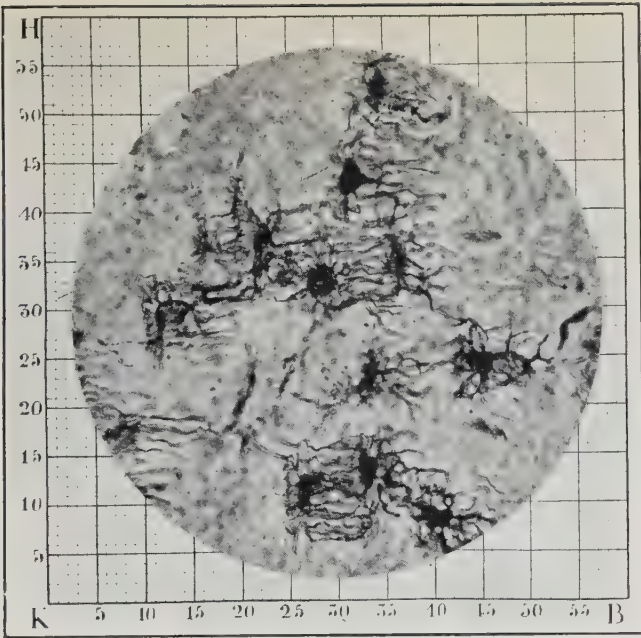


FIG. 35—X530. CELLULAR CEMENTUM (HUMAN).

This illustration shows numerous cemental lacunae in this tissue, and the free anastomosis of their many canaliculi, forming an inter-communicating net-work of lymph-spaces.

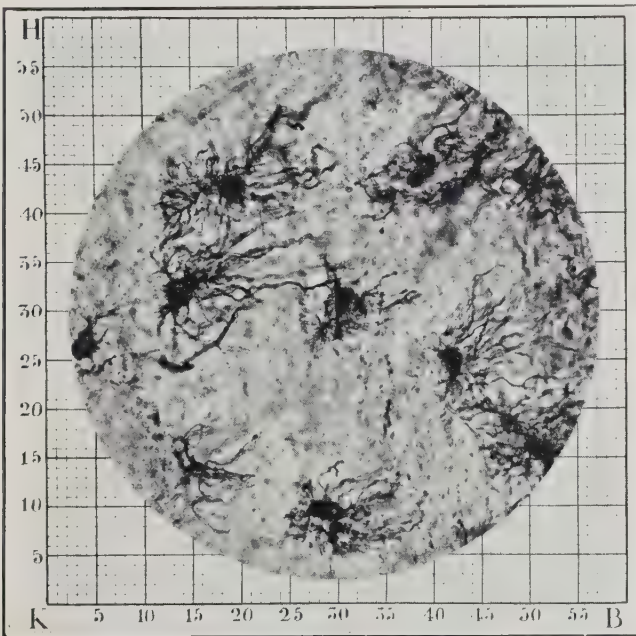


FIG. 36—X530. CELLULAR CEMENTUM (HUMAN).

Here also are shown several lacunae with their canaliculi radiating from them in all directions. Note again the anastomosis of these fine channels.

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